

Rec'd PCT/PTO 22 FEB 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 March 2004 (04.03.2004)

PCT

(10) International Publication Number
WO 2004/018039 A1

(51) International Patent Classification⁷: **A61N 1/40**

(21) International Application Number:
PCT/IB2003/003716

(22) International Filing Date: 15 August 2003 (15.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
102 38 853.9 24 August 2002 (24.08.2002) DE

(71) Applicant (for DE only): **PHILIPS INTELLECTUAL
PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-
damm 94, 20099 Hamburg (DE).

(71) Applicant (for all designated States except DE, US):
KONINKLIJKE PHILIPS ELECTRONICS N.V.
[NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven
(NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GLEICH, Bernhard**
[DE/DE]; c/o Philips Intellectual Property & Standards
GmbH, Weissshausstr. 2, 52066 Aachen (DE).

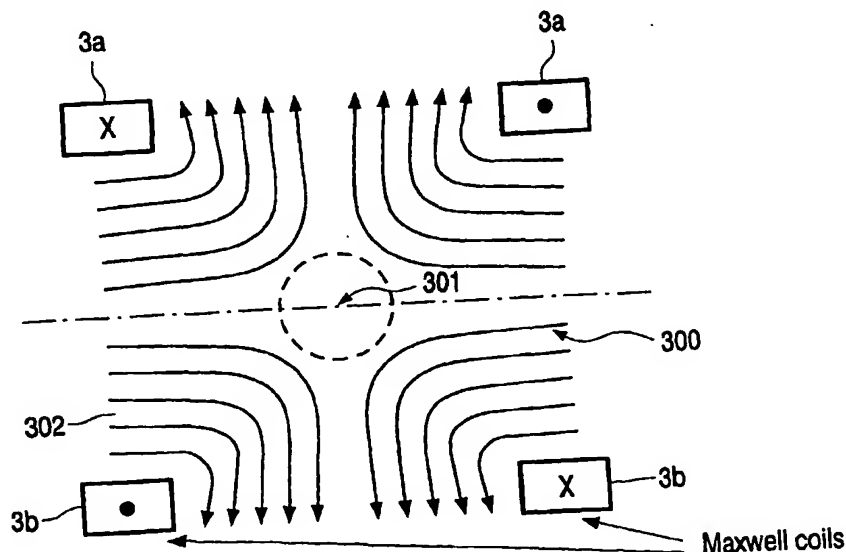
(74) Agent: **MEYER, Michael**; Philips Intellectual Property &
Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

[Continued on next page]

(54) Title: METHOD FOR LOCAL HEATING BY MEANS OF MAGNETIC PARTICLES



(57) Abstract: The invention relates to a method as well as to a system for the local heating of a target region of an object by varying the magnetization of magnetic or magnetizable substances. A magnetic field is then generated whose magnetic field strength varies in space in such a manner that a first sub-region (301) of low magnetic field strength and a second sub-region (302) which encloses the first sub-region and has a higher magnetic field strength are formed in the target region. Subsequently, the position in space of the two sub-regions in the target region is varied with a given frequency for so long that the particles are heated to a desired temperature due to frequent variation of the magnetization.

WO 2004/018039 A1



SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(15) Information about Correction:

see PCT Gazette No. 07/2005 of 17 February 2005, Section II

Published:

— with international search report

(48) Date of publication of this corrected version:

17 February 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

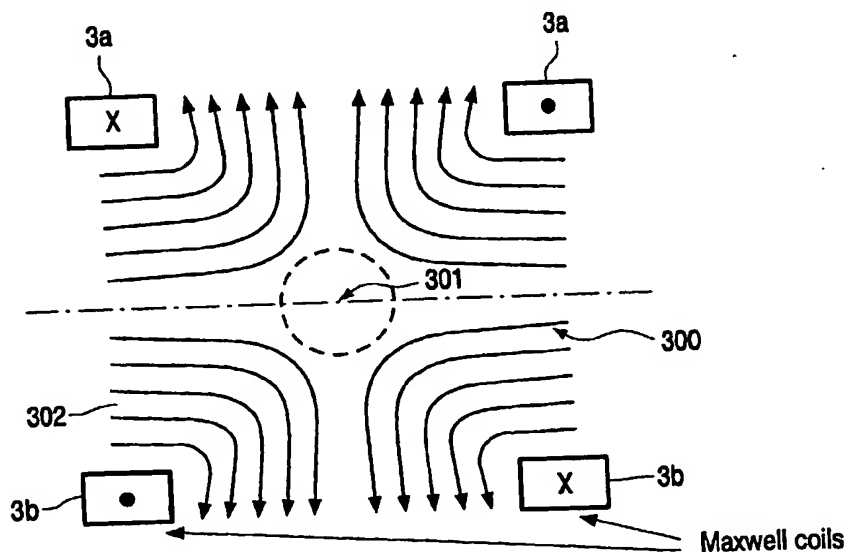
(19) World Intellectual Property
Organization
International Bureau(43) International Publication Date
4 March 2004 (04.03.2004)

PCT

(10) International Publication Number
WO 2004/018039 A1

- (51) International Patent Classification⁷: **A61N 1/40**
- (21) International Application Number: **PCT/IB2003/003716**
- (22) International Filing Date: **19 August 2003 (19.08.2003)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
102 38 853.9 **24 August 2002 (24.08.2002)** **DE**
- (71) Applicant (for DE only): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH [DE/DE];** Stein-damm 94, 20099 Hamburg (DE).
- (72) Inventor; and
(75) Inventor/Applicant (for US only): **GLEICH, Bernhard [DE/DE];** c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
- (74) Agent: **MEYER, Michael;** Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**
- (71) Applicant (for all designated States except DE, US): **KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL];** Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

[Continued on next page]

(54) Title: **METHOD FOR LOCAL HEATING BY MEANS OF MAGNETIC PARTICLES**

(57) Abstract: The invention relates to a method as well as to a system for the local heating of a target region of an object by varying the magnetization of magnetic or magnetizable substances. A magnetic field is then generated whose magnetic field strength varies in space in such a manner that a first sub-region (301) of low magnetic field strength and a second sub-region (302) which encloses the first sub-region and has a higher magnetic field strength are formed in the target region. Subsequently, the position in space of the two sub-regions in the target region is varied with a given frequency for so long that the particles are heated to a desired temperature due to frequent variation of the magnetization.

WG 2004/018039 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No
PCT 03/03716

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61N1/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 199 37 492 A (MFH HYPERTHERMIESYSTEME GMBH) 10 May 2001 (2001-05-10) cited in the application column 3, line 53 -column 7, line 45; figures	1,9
A	WO 01 18168 A (FREDRIKSSON SARAH ;GENOVIS AB (SE); KRIZ DARIO (SE)) 15 March 2001 (2001-03-15) page 4, line 34 -page 8, line 9; figures	1,9
A	US 4 690 130 A (MIRELL STUART G) 1 September 1987 (1987-09-01) column 3, line 42 -column 4, line 68; figures	1,9

	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *g* document member of the same patent family

Date of the actual completion of the international search

17 November 2003

Date of mailing of the international search report

25/11/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Rakotondrajaona, C

INTERNATIONAL SEARCH REPORT

Internatio
PC 03/03716

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 913 167 A (PARAGON MEDICAL LIMITED) 6 May 1999 (1999-05-06) page 3, line 19 -page 6, line 30; figures -----	1,9
A	EP 0 400 940 A (LEVEEN HARRY H) 5 December 1990 (1990-12-05) page 9, column 15, line 4 -page 10, column 18, line 4; figures -----	1,9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 03/03716

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1-8 : partially searched.
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 1-8 have been searched, excluding the aspect relating to a Method for treatment of the human or animal body by therapy- Rule 39.1(iv) PCT.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/03/03716

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19937492	A	10-05-2001	DE 19937492 A1	10-05-2001
			AT 227148 T	15-11-2002
			AU 6824100 A	05-03-2001
			BR 0007016 A	19-06-2001
			CA 2344885 A1	15-02-2001
			CN 1319029 T	24-10-2001
			DE 50000720 D1	12-12-2002
			WO 0110501 A1	15-02-2001
			EP 1102609 A1	30-05-2001
			JP 2003506163 T	18-02-2003
			TR 200101023 T1	21-08-2001
			US 2001012912 A1	09-08-2001
WO 0118168	A	15-03-2001	AU 7465600 A	24-04-2001
			AU 762598 B2	26-06-2003
			AU 7466700 A	10-04-2001
			BR 0013882 A	02-07-2002
			CA 2382434 A1	15-03-2001
			EP 1210601 A1	05-06-2002
			EP 1234018 A1	28-08-2002
			JP 2003509019 T	11-03-2003
			NO 20020923 A	02-05-2002
			WO 0122088 A1	29-03-2001
			WO 0118168 A1	15-03-2001
			AU 7465700 A	10-04-2001
			BR 0013791 A	14-05-2002
			CA 2383465 A1	15-03-2001
			EP 1214119 A1	19-06-2002
			JP 2003508173 T	04-03-2003
			WO 0117611 A1	15-03-2001
			SE 9903187 A	09-03-2001
US 4690130	A	01-09-1987	EP 0252118 A1	13-01-1988
			WO 8703798 A1	02-07-1987
EP 0913167	A	06-05-1999	CN 1217219 A	26-05-1999
			EP 0913167 A2	06-05-1999
			JP 11197257 A	27-07-1999
			TW 426532 B	21-03-2001
			US 6149576 A	21-11-2000
EP 0400940	A	05-12-1990	US 5099756 A	31-03-1992
			AU 643212 B2	11-11-1993
			AU 5608390 A	06-12-1990
			CA 2017816 A1	01-12-1990
			EP 0400940 A2	05-12-1990
			JP 3094772 A	19-04-1991